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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/699,419	10/31/2000	Morio Gaku	2000 1503A	7293

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EXAMINER

AHMED, SHAMIM

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 07/08/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/699,419

Applicant(s)

GAKU ET AL.

Examiner

Shamim Ahmed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 1-14 and 19-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-18 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II, claims 15-18 in Paper No. 6 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Response to Arguments

2. Applicant's arguments with respect to claims 15-18 have been considered but are moot in view of the new ground(s) of rejection.

As to the Gaku et al, applicants argue that Gaku et al do not teach that the copper-clad board has a metallic-treatment layer surface, wherein the layer contains nickel as an essential component.

In response, examiner states that the argument is not persuasive because Gaku et al teach that the surface of the copper foil to be irradiated with the laser is oxidized to form a metal oxide or coating or a sheet is formed and the coating comprises a metal powder such as nickel (col.8, lines 46-52 and col.9, lines 7-11).

Applicants also argue that the element "nickel" of the metallic treatment layer has a high absorption rate of a carbon dioxide gas laser.

In response, examiner states that Gaku et al's metallic treatment layer could comprises nickel and would inherently provide the property of high absorption of carbon dioxide gas laser by nickel as evidence by Rogers (USP 5,257,140), in which Rogers

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teaches that nickel absorbs over quite a large band, including the carbon dioxide laser (col.1, lines 42-44).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 15-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Gaku et al (6,280,641).

As to claims 15-16, Gaku et al disclose a process for making a hole in a metallic-treated copper foil surface of a copper-clad board or printed circuit board by irradiating a carbon dioxide gas laser beam having an energy sufficient to make the hole by means of the pulse oscillation of the laser beam, wherein the energy of the carbon dioxide gas laser is 20-60 mJ (claim 16) (see col.4, lines 11-29).

As to the requirement of claim 15, which depends on claim 1, Gaku et al inherently teach that an alloy of the copper foil and the metallic-treatment layer is formed during the laminating of the double sided copper foil and the thermosetting resin layer under heat and pressure during the formation of the product of copper clad laminate (see col.6, lines 27-36).

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Gaku et al also disclose that the surface of the copper foil to be irradiated with the laser is oxidized to form a metal oxide or coating or a sheet is formed and the coating comprises a metal such as nickel (col.8, lines 46-52 and col.9, lines 7-11).

Gaku et al, further disclose that the energy of the laser at the starting and ending of the process of making the hole is substantially the same such as at the beginning the energy is 20-60 mJ and at the end is 20-35 mJ (col.10, lines 57-67).

As to claim 17, Gaku et al teach that after irradiation with the laser beam, copper foil on each surface is two-dimensionally etched to remove burrs around the via hole (col.11, lines 4-7).

As to claim 18, Gaku et al teach that the hole diameter is 100 μm (col.12, lines 60-64).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inagawa et al (5,073,687) in view of Takami (JP 4-71292).

Inagawa et al disclose a process for making a hole in a copper-clad board or printed circuit board by irradiating a laser beam having an energy sufficient to make the hole by means of the pulse oscillation of the laser beam, wherein the laser beam is carbon dioxide gas laser (col.2, lines 30-64, col.3, lines 2-5 and col.4, lines 5-8 and lines 62-67).

Inagawa et al also disclose that the irradiation energy of the laser is increasing from beginning to end to make the hole (col.4, lines 65-col.5, line 4).

Inagawa et al fail to disclose that the copper foil surface is metallic treated and the metallic treatment layer contains nickel.

However, in a method of making a copper foil for printed circuit board, Takami teaches that the copper foil is treated to form a coating of a barrier layer consists of nickel to improve the heat resistance and adhesion capability of the copper foil (see the abstract).

Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to combine Takami's teaching into Inagawa et al's process for improving the heat resistance and adhesion capability of the copper foil during the manufacturing of a printed circuit board as taught by Takami.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Japanese abstract (JP-2000126393) disclose a process of making a copper clad laminate having the copper foil surface treated with nickel, wherein the treated copper foil and the basic resin material can be bored simultaneously using a carbon dioxide gas laser. This JP abstract is not a prior art but cited as a related invention.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (703) 305-1929. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Shamim Ahmed
Examiner
Art Unit 1765

SA
June 28, 2003


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700